Spending Profiles of National Forest Visitors, 2002 Update

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This report is based on an analysis of National Forest Visitor Use Monitoring (NVUM) Survey Data for the first three years covering calendar year 2000, and fiscal years 2001 and 2002.

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ABSTRACT: This report presents national forest visitor spending profiles developed from the National Forest Visitor Use Monitoring (NVUM) project surveys collected between January, 2000 and September, 2002. The report is an update of an earlier report covering the first two years of NVUM survey data. The FY2002 NVUM surveys add an additional 5,195 cases with spending data from an additional 29 forests. Changes from the two year national spending averages are generally minor and likely due mostly to the mix of forests sampled each year. The increased sample size reduces sampling errors for the national averages and also permits the reporting of spending profiles for some additional activity-based segments. National average spending profiles are developed for seven trip type segments: day trips and overnight trips involving stays on and off the forest for local and non-local visitors, and visitors whose primary trip purpose was not recreation on the forest. Distinct spending profiles are also estimated for high and low spending areas and for selected recreation activity subgroups.

BACKGROUND ON NVUM SURVEYS

The objective of the USDA Forest Service National Visitor Use Monitoring study (NVUM) is to estimate the number of recreation visits to national forests (English et al. 2002). To achieve this objective a selection of individual forests in each region are sampled yearly with each administrative forest in the National Forest System being sampled once every five years.

In addition to data necessary to estimate visitation, the NVUM survey gathered other visitor and trip characteristics. A separate economics survey administered to roughly one quarter of those sampled gathered spending information that provides the basis for development of the spending profiles reported here.

The analysis here is based on data gathered during the first three years of the NVUM survey, covering 90 of the 119 administrative national forests, grasslands, and recreation areas sampled under NVUM. This report updates an earlier one (Stynes and White 2003) that estimated spending profiles from the first two years of the survey. National average spending profiles have remained fairly consistent over the three years, with some variations likely due to the mix of forests sampled each year.

The increase in the overall sample size by adding year three data yields a modest increase in the reliability of the national average estimates. More importantly, year three surveys provide spending estimates for another 29 forests and the additional cases help to identify differences in spending for some additional activity subgroups.

METHODS

National forest visitors were sampled at both designated recreation sites and in the general forest area (GFA) of individual forests. A stratified sampling scheme was employed for sites and days based upon the expected visitation (high, medium, or low visitation) at a given location on a given day (termed a "site day").

During the first three years of the NVUM study, a total of 61,995 visitors completed an NVUM survey[1]. Roughly one quarter (15,092) of these respondents also answered a supplemental set of spending questions (Table 1). The economics portion of the NVUM questionnaire measured spending of a randomly selected adult in the travel party within fifty miles of the forest on the current recreation trip. Although the questionnaire requested spending of individual visitors, based on our analysis of the data gathered during the first two years and comparisons with other studies, we concluded that most respondents reported spending for the entire travel party (Stynes, White and Leefers, 2003)[2]. This assumption is assumed to also apply to the FY2002 surveys.

[1] 5,767 cases in the three-year NVUM dataset contained no data and were excluded from our analysis.
[2] The questionnaire has been modified to gather spending on a party basis in FY2003.

Table 1. Breakdown of the NVUM sample by Year

	2000	2001	2002	3 Year Total
Total Sample	19,351	22,015	20,589	61,955
Cases with economic data	4,347	4,957	5,788	15,092
Outliers in economic data				
Days away from home >= 30	115	107	146	368
People in vehicle >= 8	76	82	79	237
Total spending >= 1000	129	176	210	515
Missing Zip code	181	192	158	531[a]
Total omitted cases	501	557	593	1,651
Final Cases for economic analysis	3,846	4,400	5,195	13,441

[a] In total, 661 cases had missing Zip codes (excluding foreign travelers). Of these, 60 were removed as outliers. Of the remaining 601 cases, 70 cases are included within the non-primary purpose trip segment. The remaining 531 are excluded in analyses by trip segment.

National forest visitors reported spending in ten categories[3]. The economics portion of the NVUM survey also recorded the number of days away from home during their entire trip and whether the national forest was the primary destination of their trip. These two variables, along with the Zip code of the respondent and whether the visitor spent the previous night on the NF were used to form trip type segments. Activity segments are based on the primary recreation activity on the sampled visit.

ANALYSIS METHODS

The analysis of the spending data involved (1) some additional data cleaning and removal of outliers, (2) checking for representativeness of the economic subsample relative to the full sample, (3) choosing appropriate weights for the analysis, (4) testing for differences in spending across visitor subgroups, and (5) estimating spending averages for meaningful segments with distinct spending patterns.

Only a brief discussion of analysis procedures and technical issues is included here. A more complete treatment is included in Stynes, White and Leefers (2003). Analytical procedures for the combined three-year data set are identical to those used in the two-year report (Stynes and White 2003) with one exception. This report employs an additional database of Zip codes for classifying NVUM respondents as local and non-local.

Defining Local Visitors. In previous years a single spatial database of Zip codes developed by Environmental Systems Research Institute (ESRI) was used to identify Zip

[3] Private lodging, public lodging, restaurants and bars, gasoline and oil, activity expenses, souvenir purchases, other transportation expenses, other food purchases, recreation fees, and miscellaneous spending

codes within 30-50 miles of individual forests[4]. Beginning this year, the location of Zip codes reported by NVUM respondents (in all three years) was identified using both Delorme Street Atlas 2004 and the ESRI database used in previous analysis. The use of Delorme Street Atlas 2004 resulted in the identification of an additional 293 Zip codes (reported by year 1 and 2 respondents) within 30 miles of a forest boundary. These Zip codes were missing from the ESRI database and were therefore classified as "non-local" previously. As result of this change, 511 NVUM respondents from the first two NVUM years were reclassified from "non-local" to "local" trip segments. In addition, 246 year 1 and 2 NVUM respondents were found to have reported Zip codes that did not exist in either the ESRI database or Delorme Street Atlas 2004. Beginning this year, these cases are shifted from "non-local" to "missing" trip segments. These reclassifications have small effects on the national spending averages but increase the percentage of visitors identified as local.

Outliers/Contaminants: Long trips (days away from home >=30), large parties (people in the vehicle >=8), and cases with very high total spending (>=$1,000) were omitted from the spending analysis. Spending data for very long stays or covering large parties were deemed unreliable. Spending reports of $1,000 or more were omitted as these cases appeared to include airfares, other expenses outside the local area, or expenditures not clearly related to the NF visit. Dropping these cases yields more conservative spending averages, but likely better represents what a typical NF visitor spends. Since the NVUM sampling design resulted in very high weights for some cases, the omission of outliers also helps to reduce the sensitivity of subgroup parameter estimates to a small number of atypical cases.

Cases with missing Zip codes were dropped in estimating spending patterns of local versus non-local visitors. After omitting contaminants, outliers and cases with missing data, 13,441 cases were available from which to develop spending profiles within a set of trip type segments.

Representativeness: Comparisons of selected variables between cases completing the economics portion of the questionnaire versus the overall sample did not reveal any significant differences. The economics sub-sample is therefore assumed to be representative of the entire sample. Representativeness of the overall NVUM sample rests on the stratified sampling design and case weighting to adjust for disproportionate sampling of site days across strata[5]. As the NVUM study was designed primarily to develop reliable use estimates at the national level, the sample may not be completely representative of visitors at the individual forest level. Forest level statistics should therefore be used with caution.

[4] Zip codes were identified as local if the Zip code centroid was within 30 straight-line miles of the forest boundary. Taking into account road circuity factors, locations of residences within the Zip code, and locations of recreation sites within the forest, distances from the subject's home to the site will be greater than 30 miles. Beginning in FY2003, a direct question will be used to measure distance from home.
[5] See English et. al. 2002 for sampling details.

Weights: Two distinct weights are applied to adjust the sample for disproportionate sampling across strata and different levels of exposure of individual visitors to sampling. The exposure weight for each case is the inverse of the number of sites visited. A visitor stopping at two distinct sites on the forest during their visit has twice the chance of being selected as a visitor stopping at only one site and hence is weighted ½ when estimating characteristics of NF visits. Visitors on overnight trips, particularly those staying overnight on the forest were more likely to visit multiple sites.

Strata weights adjust the sample to reflect the number of site days sampled within each stratum[6]. Case weights are the product of the exposure and strata weights. The case weights are used in estimating segment shares, lengths of stay, party sizes and most other visit and visitor characteristics.

Only the exposure weights are used in estimating spending averages. Spending measures do not vary systematically with the NVUM strata and therefore the case weights do not generally influence the overall spending averages. However, due to small sample sizes within strata at the individual forest level (or for other narrowly defined subgroups of visitors) and wide variations in sampling ratios across strata[7], spending estimates for individual forests that employ strata weights can be sensitive to a small number of cases with very high weights. To avoid this problem, all spending averages are computed using only the exposure weights. Exposure weighting reduces the spending averages compared to un-weighted estimates as visits involving multiple site visits tended to be longer and involve higher spending.

Subgroup Analysis: The rationale for and definition of visitor trip segments is discussed further below. The key subgroups for explaining visitor spending were identified in the analysis of the first two years of NVUM data. Analysis of variance indicated that trip type segments were the best predictors of spending. Variations in spending across forests and recreation activities were much smaller and frequently explained by differences in the trip segment mix for a given forest or activity. Procedures for the spending analysis therefore begin by dividing visitors into trip type segments. Spending averages are then estimated for each segment. Spending estimates presented for other subgroups (e.g., by forest or recreation activity groups) take into account variations resulting from the mix of trip types.

NATIONAL FOREST VISITOR SEGMENTS

A primary objective of the economic analysis is to estimate spending profiles for a set of meaningful visitor segments. To be useful, the segments must a) be identifiable from the NVUM survey variables, b) help to explain differences in spending across different

[6] Strata were defined as high, medium and low use site days within four types of sites (OUDS, DUDS, WILD and GFA). Weights for sites with proxy measures of site use were based on actual proxy use counts. See English et. al. 2002 for details.

[7] Strata weights vary from as low as 1 to as high as 100,000. Hence a single case with very high spending could significantly influence the spending averages while hundreds of cases with low weights could have almost no influence at all.

applications, c) be large enough to obtain adequate sample sizes in the survey, and d) be meaningful to anticipated national forest management and policy applications.

Seven trip type segments were identified in the analysis of the first two years of NVUM data.

National Forest Visitor Trip Type Segments

1. **Non-local day trips**: Non-local residents on day trips
2. **Non-local OVN-NF**: Non-local residents staying overnight on the NF
3. **Non-local OVN:** Non-local residents staying overnight off the NF
4. **Local day trips**: Local residents on day trips
5. **Local OVN-NF**: Local residents staying overnight on the NF
6. **Local-OVN**: Local residents staying overnight off the NF
7. **Non-Primary**: Visits where recreating on the NF is not the primary trip purpose.

Local visitors are defined as living within 50 miles of the recreation site[8]. Overnight visitors (OVN) are those that reported being away from home more than 24 hours on their trip[9]. The OVN-NF segments are composed of those visitors who stated that they spent the previous night on the national forest[10]. The "non-primary" segment consists of visitors whose primary trip purpose was not recreation on the NF.

Spending differences are largest between day trips and overnight trips. There are also differences among overnight visitors between those staying on or off the forest.
The trip type segmentation also distinguishes local visitors from non-local visitors and splits out non-primary purpose trips as a distinct segment. Identifying locals as a set of distinct segments facilitates distinguishing "new" money (exports) brought in by non-locals from spending by local residents when completing a regional economic analysis[11]. Likewise, the spending by visitors in the non-primary segment can be included or not depending on the purpose of a given analysis[12].

[8] Formally, locals were defined using the Zip code variable to determine the straight-line distance from the center of the Zip code to the forest boundary. Distances of 30 miles or less were defined as locals. Taking into account the additional distance from the forest boundary to the recreation site, distances from the residence to Zip code centroid and road circuity, locals should be interpreted as living within roughly a 50 mile driving distance of the site.

[9] As the survey did not measure nights spent in the local area, the overnight segments will include some visitors on extended trips that do not spend any nights locally. Spending reports, however, were restricted to spending within 50 miles of the site.

[10] This may mis-classify some visitors sampled on the first day of their visit. Since only last-exiting vehicles were interviewed this will not be a problem for visitors contacted at camping sites; however, some NF campers may have been sampled at day use sites prior to setting up camp.

[11] For use in an economic impact analysis, the definition of the "local region" depends on the region for which impacts are desired. The region should include places where visitors might stay and spend money during a trip to the area. In most cases regions are defined as collections of counties around the forest.

[12] The "non-primary" segment can also be divided between local and non-local residents, but is grouped in the analyses reported here, because most visitors (79%) whose primary purpose was not to visit the NF are non-local.

Spending profiles are developed first for the seven trip type segments, as these explain much more variation in individual visitor spending than recreation activities. Variations in spending across forests and activities are frequently explained by the mix of trip segments. For example, forests or sites that attract more local visitors and day trips have lower visitor spending averages than those serving larger percentages of overnight visitors. Local residents on day trips account for a greater share of some activities such as hiking, biking and picnicking, which in part explains why these activities have below average spending.

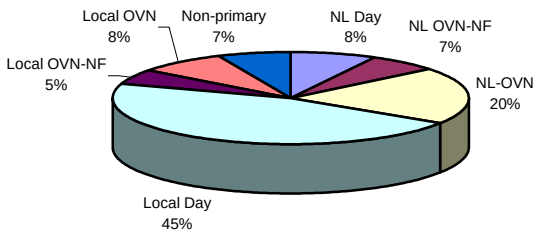
SEGMENT SHARES

The percentage of national forest visits within the seven trip type segments can be estimated from the three years of NVUM data. Local residents on day trips are the largest segment, accounting for 45% of all visits (Figure 1). Another 13% of visits are local residents on overnight trips staying either on- or off- the forest.

Non-local visitors are more likely to be on overnight trips. Twenty percent of NF visits are non-local visitors staying overnight off of the forest, 7% are non-local visitors staying overnight on the forest and 8% are non-local day trips.

Another 7% of visits are trips where recreating on the national forest was not the primary trip purpose (Figure 1). The majority of non-primary purpose trips are visitors from outside the local region, often involving other activities in the area or a stop en route to other destinations. Non-primary purpose trips are identified as a distinct segment as much of the spending on these trips cannot be directly attributed to the national forest visit.

Figure 1. National Forest Visitor Trip Type Segments



Segment shares vary widely across recreation activities, seasons of the year, individual forests, and specific sites on a given forest. Variations in these trip type segment shares across forests (Table A-2) and primary recreation activity (Table A-5) are shown in Appendix A.

The national estimates of segment shares are somewhat sensitive to the choice of weights in the NVUM sample and also the exclusions of outliers (Table 2). Outliers primarily come from the non-primary purpose and non-local overnight off-forest segments. The trips that these outliers represent frequently involve extended trips with multiple purposes and an unknown amount of spending not directly related to the NF visit.

Table 2. National Forest Visitor Segment Distribution, Three Years 2000-2002

	Number of cases [a]		Percent				
	All Cases	Omitting Outliers	All Cases	Drop Outliers	Exposure Wt	Case Wt	Full Info[c]
Non-Local Day	1,096	1,079	8%	8%	9%	8%	8%
Non-Local OVN-NF	1,958	1,802	13%	13%	11%	8%	7%
Non-Local -OVN	2,556	2,148	18%	16%	15%	17%	20%
Local Day	5,172	5,098	36%	38%	43%	48%	45%
Local OVN-NF	1,166	1,122	8%	8%	8%	6%	5%
Local OVN	1,056	996	7%	7%	8%	8%	8%
Non-Primary[b]	1,514	1,196	10%	9%	8%	6%	7%
Total	14,518	13,441	100%	100%	100%	100%	100%

[a] Cases with missing Zip codes not classified as non-primary are omitted in estimating segment shares.

[b] 21% of "non-primary" visitors are local residents.

[c] The full information segment shares are computed using case weights and information from both the economics and general sections of the survey.

Exposure weighting reduces the shares of overnight trips relative to day trips, as overnight visitors are more likely to visit multiple sites on the forest. Case weights and the full information estimates increase the percentage of local day trips and non-local OVN trips relative to overnight on-forest segment shares.

The "full information" estimates in the right hand column of Table 2 are the best estimates of the national segment shares as these use the case weights to adjust for disproportionate sampling and make use of additional information in the general survey. The "full information" estimates take advantage of the larger samples completing the general survey to estimate segment shares more reliably. A partial segmentation was developed from questions in the general survey using all cases. Variables from the smaller economic sub-sample were then used to distribute these segments into the final seven trip type segments[13].

The segment mix has changed somewhat over the three years of NVUM surveys (Table 3). Non-local overnight trips have increased from 16% to 25% of all visits, while local day trips have declined from 52% to 41%. Other segments each consistently represent 5-9% of all visits, fluctuating somewhat within this range. Year to year differences seem to reflect the mix of forests sampled each year, although they may also be due to the kinds of sites sampled on each forest.

[13] The general survey obtained the Zip codes of respondents (to identify local visitors) and whether or not the visitor spent the night on the NF while the number of days away from home on the trip and the primary trip purpose were measured for the economics sub-sample.

Table 3. Comparison of Full Information Segment Shares by Year

	Non-Local Segments			Local Segments				
Year	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
2000	6%	5%	16%	52%	5%	9%	8%	100%
2001	8%	7%	20%	43%	4%	9%	8%	100%
2002	9%	7%	25%	41%	6%	6%	5%	100%
2000 & 2001	7%	6%	18%	47%	5%	9%	8%	100%
Three Years	8%	7%	20%	45%	5%	8%	7%	100%

SPENDING PROFILES

Spending profiles give the average amount spent within a set of spending categories for a particular subgroup of visitors. The unit of analysis for spending is the party trip, covering all expenses by the travel party within 50 miles of the interview site during their stay in the area.

1. National averages by trip type segments

Table 4 presents the national spending averages across all national forest visits based on the spending reports of 13,441 visitors sampled on 90 national forests between January, 2000 and September, 2002. Profiles are estimated for the seven trip type segments defined above. Spending is itemized within ten spending categories and reported on a party trip basis. Sample sizes and sampling errors are given at the bottom of the table. For comparability, this same format is used in all subsequent spending tables.

Spending varies from $30 per party per trip for local day trips, to $50 for non-local day trips, to as high as $224 per trip for non-local visitors on overnight trips staying off the forest. Sampling error (of the totals) at the 95 percent confidence level is three percent overall and between five and 11 percent for individual segments (Table 4).

The national spending averages have changed slightly from year to year[14], although for most segments the differences are not statistically significant (Table 5). Spending averages for visitors staying overnight on the NF were higher in 2001, mainly due to higher spending on groceries and gas. Spending of local visitors on day trips was higher in the first year than the following two years. The first year also had a higher percentage of local day trips, so the difference may result from the somewhat imprecise method of assigning visitors to local or non-local segments.

[14] No adjustments have been made for year-to-year price changes. Price adjusting the 2000 and 2001 spending averages to 2002 using Bureau of Labor Statistics price indices alters the yearly totals by less than one percent. When necessary, 2001 can be assumed as the base year of the three-year spending averages.

Table 4. National Forest Visitor Spending Profile by Trip Type Segment and Spending Category, $ per party per trip[a]

	Non-Local Segments			Local Segments				
Spending category	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	All Visits[b]
Public Lodging	0.00	5.82	3.95	0.00	3.31	2.45	5.30	1.93
Private Lodging	0.00	13.36	54.14	0.00	5.89	10.59	38.78	15.62
Restaurant	13.50	26.76	54.22	6.20	14.81	18.76	41.56	21.74
Groceries	7.11	34.00	28.45	4.99	36.67	19.68	18.74	15.60
Gas & oil	15.71	35.94	31.35	11.17	25.65	23.01	26.56	20.05
Other transp.	1.38	4.29	9.10	0.28	0.28	1.15	6.86	2.94
Activities	3.41	7.80	13.50	1.53	3.61	6.22	9.82	5.57
Admissions/fees	4.86	12.23	8.46	3.02	11.20	7.96	6.11	5.92
Souvenirs	2.11	5.99	12.65	1.19	2.82	3.31	13.45	5.00
Other	2.16	9.04	8.58	1.71	6.48	6.14	6.05	4.53
Total	**50.25**	**155.22**	**224.38**	**30.09**	**110.72**	**99.26**	**173.24**	**98.91**
N (unwtd)	1,079	1,802	2,148	5,098	1,122	996	1,196	13,441
Std Dev. of Total	88	192	240	59	130	142	222	171
SE Mean of Total	2.67	4.53	5.18	0.83	3.88	4.49	6.41	1.48
Pct Error (95% level)	11%	6%	5%	6%	7%	9%	7%	3%

[a] Outliers are excluded and exposure weights are applied in estimating spending averages.
[b] All visits averages are computed as a weighted average of the columns using the national trip segment shares as weights.

Table 5. Comparison of Spending Averages by Year, $ per party per trip

	Non-Local Segments			Local Segments				
Year	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
2000	$45[a]	$136[ac]	$216[a]	$36[a]	$108[a]	$107[a]	$189[a]	$96[a]
2001	$59[a]	$191[b]	$213[a]	$28[bc]	$117[a]	$106[a]	$163[a]	$101[a]
2002	$46[a]	$141[c]	$244[a]	$27[c]	$108[a]	$81[a]	$166[a]	$93[a]
Two Years	$54[a]	$170[ab]	$214[a]	$32[ab]	$113[a]	$106[a]	$177[a]	$99[a]
Three Years	$50[a]	$155[ac]	$224[a]	$30[bc]	$111[a]	$99[a]	$173[a]	$97[a]

NOTE: All spending averages computed with exposure weights and with outliers removed.
[abc] Denotes significantly different subsets within segments. Segments with the same superscript in any column are not significantly different (95% level), while those with different superscript are. The two and three year averages are treated as if they are independent samples in this test.

The national spending profiles can be used for national estimates or for any individual forest or application involving a broad mix of visitors in which the spending patterns for the individual trip segments are assumed to be similar to these national averages. If the mix of trip segments also mirrors the national average (or is unknown), the total column may be used. Otherwise profiles for individual trip segments should be applied to the mix of trip types for the given application. Trip type segment shares for individual forests (Table A-2) and/or primary activity (Table A-5) may be used to estimate the mix of trip

types for a particular application. Reliable local information relevant to the particular application can be used to adjust or adapt estimates of segment shares or spending to a particular application.

2. High and Low Spending Areas

NVUM sample sizes are too small at the individual forest level to reliably capture differences in spending across individual forests. The overall average visitor spending for a given forest can be estimated as a weighted average of the national spending profiles using trip segment shares for the individual forest as weights (Table A-2). This procedure assumes the national trip type spending profiles in Table 4 can be generalized to the individual forest.

Spending will vary from one area to another based upon local prices and spending opportunities as well as the mix of visitors and recreation activities. To account for spending variations that are independent of the mix of trip segments, a set of "high" (Table 6) and "low" (Table 7) NF visitor spending profiles were estimated by grouping cases from forests with above or below average spending (See Stynes, White and Leefers, 2003 for details). Of the 90 forests sampled to date, half (45 forests) have visitor spending averages not significantly different from the national averages, after controlling for the segment mix. Seventeen forests have below average spending and 28 forests have above average spending (Table A-1).

Table 6. High Spending Profile by Segment and Spending Category, $ per party per trip[a]

	Non-Local Segments			Local Segments				
Spending category	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	All Visits[b]
Public Lodging	0.00	10.16	2.63	0.00	3.90	6.34	4.37	2.25
Private Lodging	0.00	16.77	69.82	0.00	13.35	16.66	48.46	20.53
Restaurant	16.78	35.44	68.17	6.99	16.46	28.70	52.41	27.39
Groceries	7.70	47.46	36.43	8.33	36.85	25.80	21.58	20.39
Gas & oil	20.90	45.69	31.36	9.95	27.00	27.71	30.92	21.35
Other transp.	1.60	5.74	12.56	0.53	0.00	4.78	8.87	4.28
Activities	5.16	11.87	20.59	1.58	2.60	5.31	26.15	8.46
Admissions/fees	7.98	15.64	10.44	1.92	11.41	7.32	5.92	6.26
Souvenirs	2.78	6.83	17.74	1.23	3.69	4.40	21.82	6.86
Other	2.56	11.97	11.59	2.10	3.90	11.11	6.89	5.87
Total	**65.44**	**207.57**	**281.34**	**32.63**	**119.16**	**138.13**	**227.39**	**123.64**
N(unwtd)	250	569	822	796	128	167	278	3010
Std Dev. of Total	109	212	256	81	121	184	242	218
SE Mean of Total	6.89	8.89	8.93	2.88	10.69	14.23	14.51	3.98
Pct Error (95% level)	21%	9%	6%	18%	18%	21%	13%	6%

[a] Outliers are excluded and exposure weights are applied in estimating spending averages.
[b] All visits averages are computed as a weighted average of the columns using the national trip segment shares as weights.

A forest identified as either a high or low spending area (Table A-1) should use the profiles in table 6 or 7, respectively, instead of the national averages in Table 4. The high and low tables can also be used for more specific applications, when there is evidence of above or below average spending. Forest locations near major tourist destinations or in close proximity or easy access to commercial areas and spending opportunities can generally expect above average visitor spending, while sites in more remote, rural areas will likely experience below average spending. An assessment of nearby spending opportunities and prices can help in deciding between the average, high, or low spending profiles.

Table 7. Low Spending Profile by Segment and Spending Category, $ per party per trip[a]

	Non-Local Segments			Local Segments				
Spending category	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	All Visits[b]
Public Lodging	0.00	2.98	1.30	0.00	2.45	1.71	1.67	0.85
Private Lodging	0.00	6.42	30.80	0.00	2.20	8.22	30.27	9.50
Restaurant	11.19	16.43	35.82	5.92	10.03	15.32	25.13	15.36
Groceries	6.58	23.78	15.90	3.95	30.83	14.25	14.82	10.87
Gas & oil	11.88	27.63	25.52	11.32	21.28	19.95	18.83	17.06
Other transp.	0.63	1.55	5.89	0.28	0.00	0.34	7.51	2.01
Activities	3.37	4.37	8.38	1.58	2.56	9.12	2.06	3.96
Admissions/fees	4.05	9.18	6.08	3.58	9.43	7.62	2.93	5.08
Souvenirs	1.32	4.11	8.12	0.67	1.74	2.28	7.88	3.14
Other	0.72	5.54	5.44	1.22	4.88	4.72	3.64	2.96
Total	**39.74**	**101.99**	**143.25**	**28.52**	**85.40**	**83.52**	**114.73**	**70.78**
N(unwtd)	475	561	380	2338	484	365	307	4910
Std. Dev. of Total	73	147	191	54	101	115	184	114
SE Mean of Total	3.34	6.19	9.78	1.11	4.59	6.03	10.49	1.63
Pct Error (95% level)	17%	12%	14%	8%	11%	14%	18%	5%

[a] Outliers are excluded and exposure weights are applied in estimating spending averages.
[b] All visits averages are computed as a weighted average of the columns using the national trip segment shares as weights.

These first three sets of spending profiles (tables 4, 6 and 7) do not require any knowledge of specific activities on the forest, but do require knowledge of the percentages of visitors who are local versus non-local, on day versus overnight trips, and staying overnight on or off the forest. Spending cannot be reliably estimated without some information about the mix of trip types.

3. Spending Profiles for Particular Activities

While trip types are the best predictors of spending, some activities have distinct spending patterns that should be taken into account when estimating spending or impacts associated with specific recreation activities on the forest. Spending profiles for specific activities are estimated using NVUM respondents identifying the given activity as their primary activity on the trip.

Differences in spending by particular activity subgroups are usually due to unique expenses associated with that activity, such as additional gas for motorized recreation activities, special fees for skiing, golf, and camping, and in some cases equipment rental/purchases on the trip for particular activities. For many activities, however, special activity-related expenses are small compared to the more general expenditures that vary more with trip types, transportation modes, length of stay and party sizes.

Tests were carried out on the NVUM data to identify activities with above or below average spending. Spending averages for all activity-trip type combinations with at least 50 cases in the three-year spending data set are reported in Table 8. Differences significantly different from the overall segment spending mean at the bottom of the column are indicated with an asterisk (95% confidence level).

Table 8. Spending Averages by Primary Activity and Segment, $ per party trip

	Non-Local Segments			Local Segments				
Primary Activity	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
Biking				20*				69*
Boating[a]		134		40*				87
Cross-country skiing			341*	38				117
Developed Camping		131	137*		115	120	108*	121*
Downhill skiing	80*		312*	44*		117		127*
Driving			155*	23*			129	63*
Fishing	41	212*	207	41*	120	83		103
General/Relaxing	49	160	237	28	115	117	150	115*
Hiking	34*	148	261*	19*	62*	73	231*	73*
Hunting		185	247*	44*	167*	104		111
No primary activity			150*	37			134	91
Nature-related[a]	51	193	203	26		105	181	112*
Multiple Activities		130	233	38	98		189	114
OHV use[a]		136		34				78*
Other[a]			217	29				88
Other non-motorized			232	28				59*
Picnic				35				68
Prim. Camp/Backpack		96*	94*		64*	96		87*
Resort								227*
Snowmobile				69*				129*
Total	**50**	**155**	**224**	**30**	**111**	**99**	**173**	**97**

NOTE: Spending means reported for segment/activity combinations with at least 50 cases. Averages computed using exposure weights and omitting outliers.

[a] "Nature-related" activities include viewing wildlife, viewing natural features, nature study, visiting a nature center, or viewing forest. "OHV use" also includes other motorized activity. "Boating" combines motorized and non-motorized boating. The "other" category includes gathering, visiting historic sites, and horseback riding.

* Indicates the mean is significantly different from the overall total at the bottom of the column (95% confidence level).

Complete spending profiles for activity-trip type combinations with significantly different spending averages (95% confidence level) are reported in Tables 9-13. Sampling errors for these individual activity-trip type segments are generally between 10 and 20% at a 95% confidence level. Some segments that are not significantly different

are shown for comparison. These spending averages for individual activities may vary across forests or individual sites.

Activity-specific spending profiles are grouped into tables covering (1) motorized activities, (2) skiing, (3) hunting and fishing, (4) camping, and (5) general day trip activities. A more complete analysis of wildlife-related activities is included in Appendix B.

Motorized Activities

Visitors whose primary activity is a motorized activity spend greater amounts on gas and oil (Table 9). For example, snowmobilers on day trips from more than 50 miles away (non-local) spend $110 per trip including $51 for gas and oil. This compares to the overall day trip spending average of $50 and $16 for gas and oil. The overall spending average for local day trips is $30 of which $11 is for gas. Local snowmobilers spend $69 per day and $31 for gas. Local day visitors whose primary activity is boating (motorized) spend about $15 more per trip than the overall local day trip average. Most of this difference is due to the higher gas and oil expenses. Spending by local OHV users on day trips isn't significantly different than the overall average, although the difference in the sample of about $4 is largely additional fuel purchases.

Table 9. Spending Profiles for Visitors in Motorized Activities; Selected Day Trip Segments, $ per party per day

	Snowmobile		Motorized Boating	OHV Use
Spending category	Non-Local Day	Local Day	Local Day	Local Day
Lodging	0.00	0.00	0.00	0.00
Restaurant	23.95	12.41	7.54	7.21
Groceries	12.43	6.43	8.34	5.75
Gas & oil	50.58	31.13	21.13	14.64
Other transp.	0.46	0.35	1.54	0.00
Activities	12.43	1.13	0.47	3.15
Admissions/fees	8.60	6.96	4.44	0.91
Souvenirs	0.57	6.56	0.09	1.03
Other	1.23	4.36	1.14	1.46
Total	**110.25**[a]	**69.34**	**44.69**	**34.14**[a]
N	46	116	81	132
Std Dev. of Total	155	89	54	55
SE Mean of Total	23	8	6	5
Pct Err (95% level)	41%	24%	27%	28%

[a] Not significantly different from the overall segment spending average at 95% confidence level.

Skiing

Higher spending of skiers results primarily from greater expenditures for activities and admissions and fees, reflecting the additional costs of lift tickets and use fees (Table 10). Non-local downhill skiers spend $40-$50 per party on activities/fees, which accounts for most of the difference in spending compared to the overall average for the corresponding trip segment. Somewhat lower spending on activities and fees of local skiers may reflect the omission of season passes in the spending reports. Higher lodging expenses for skiers on overnight trips will reflect the greater percentage staying in resorts and lodges, compared to summer visitors, although an unknown number of skiers on overnight trips may be staying in owned seasonal homes or with friends and relatives[15].

Cross country skiers on overnight trips spent even more than downhill skiers per trip. Spending by local cross-country skiers on day trips is not statistically different than the overall local day trip average.

Table 10. Skier Spending Profiles for Selected Trip Segments, $ per party per trip

	Downhill Ski				Cross Country Skiing	
Spending category	Non-Local Day	Local Day	Non-Local-OVN	Local OVN	Non-Local OVN	Local Day
Lodging	0.00	0.00	79.91	15.14	117.11	0.00
Restaurant	14.31	10.13	58.84	29.14	88.94	9.61
Groceries	6.33	2.43	23.54	8.00	34.70	8.89
Gas & oil	13.25	11.81	27.31	14.40	28.88	7.32
Other transp.	0.00	0.02	28.67	1.14	11.29	0.00
Activities	16.27	9.00	37.20	12.02	24.41	4.57
Admissions/fees	23.90	8.81	30.92	18.47	8.92	5.15
Souvenirs	1.62	1.28	15.94	1.34	14.05	1.30
Other	4.40	0.71	9.47	17.03	12.36	0.81
Total	**80.07**	**44.19**	**311.81**	**116.67** [a]	**340.67**	**37.64** [a]
N	76	223	110	55	53	144
Std Dev. of Total	91	63	288	171	272	94
SE Mean of Total	10	4	27	23	37	8
Pct Err (95% level)	26%	19%	18%	40%	22%	41%

[a] Not significantly different from the overall segment spending average at 95% confidence level.

[15] Specific lodging types were not measured in the first three years of the NVUM survey. Greater detail on lodging types will be available in year 4.

Hunting and Fishing

Distinct spending profiles are identified for hunters and anglers within selected trip type segments (Table 11). Non-local anglers who stayed the night on the national forest and local anglers on day trips spent significantly more than the average for all visitors in those segments. Local hunters, whether on a day trip or spending the night on the national forest, also spent significantly more than the average for those trip type segments. The spending of non-local OVN-NF hunters and local OVN-NF anglers was also greater than average, though this difference was not statistically significant. The greater spending by hunters and anglers can mostly be attributed to higher expenditures in the lodging, groceries, gas and oil, and "other" expenditure categories.

Table 11. Spending Profiles for Hunting and Fishing, $ per party per trip

	Fishing			Hunting		
Spending category	Non-Local OVN-NF	Local Day	Local OVN-NF	Non-Local OVN-NF	Local Day	Local OVN-NF
Lodging	39.06	0.00	19.15	12.30	0.00	2.89
Restaurant	34.74	7.53	16.18	30.95	5.69	21.40
Groceries	45.16	8.04	34.90	42.40	8.81	56.22
Gas & oil	46.16	15.00	28.10	59.91	16.50	43.51
Other transp.	5.48	0.04	0.00	0.00	0.00	1.71
Activities	10.90	2.34	3.99	3.71	1.01	4.49
Admissions/fees	10.54	4.22	8.61	7.31	1.80	4.42
Souvenirs	7.46	0.85	2.23	8.95	3.60	14.62
Other	12.62	3.06	7.24	19.40	6.74	17.85
Total	**212.12**	**41.08**	**120.40** [a]	**184.91** [a]	**44.16**	**167.12**
N	205	434	98	113	276	73
Std Dev. of Total	218	80	136	194	77	176
SE Mean of Total	15	4	14	18	5	21
Pct Err (95% level)	14%	19%	23%	20%	21%	25%

[a] Not significantly different from the overall segment spending average at 95% confidence level.

Some USDA FS programmatic analyses require separate estimates for wildlife-related activity including hunting, fishing and wildlife viewing. Appendix B presents a more detailed analysis of wildlife-related visitors including a comparison of wildlife-related and non-wildlife-related visitors. Grouping of the three wildlife-related activities yields larger samples for subgroup analyses, although this aggregation loses differences among the three activities. From Table 11 we see that anglers spend slightly more than hunters if staying overnight on the forest, but spend slightly less on day trips or when staying overnight off the forest.

Camping

Among visitors staying overnight on the national forest, two distinct groups of campers may be identified with distinct spending patterns (Table 12). Those staying in primitive campgrounds or the backcountry spend $95 per trip if non-local and $74 if local. Campers staying in developed campgrounds spend 40-60% more than primitive campers. Camping fees account for some of the difference[16], but those camping in developed areas also spend almost twice as much on groceries and roughly 50% more on gas and oil. Campers from the local area spend less than those from outside the local region.

Table 12. Trip Spending Profiles for Campers, $ per party per trip*

	Primitive Camping		Developed Camping	
Spending category	Non-Local Visitors	Local Visitors	Non-Local Visitors	Local Visitors
Lodging	6.08	3.84	8.26	5.99
Restaurant	16.48	12.17	22.69	13.44
Groceries	18.71	24.73	35.16	43.24
Gas & oil	23.15	19.14	32.12	25.46
Other transp.	7.76	0.14	2.08	0.40
Activities	5.74	0.99	5.89	3.47
Admissions/fees	7.20	6.06	15.76	18.56
Souvenirs	3.32	0.41	3.88	2.15
Other	6.67	6.33	7.10	3.96
Total	**95.11**	**73.82**	**132.92**	**116.68**
N (unwtd)	269	155	442	448
Std Dev. of Total	149	80	162	129
SE Mean of Total	9	6	8	6
Pct Error (95% level)	19%	17%	12%	10%

* Campers staying on or off the forest are combined here. There was no difference in spending by these two groups for developed camping, but the difference was statistically significant for primitive camping ($64 if on-forest and $96 if off-forest).

[16] Camping fees may have been reported as lodging or as admissions/fees and in some cases possibly as activity expenses.

General Day Trip Activities

Spending averages for biking, hiking and driving for pleasure on day trips were about a third less than the general day trip spending averages. As the spending profiles for these activities are similar, they are grouped together in Table 13.

Table 13. Day Trip Spending Profiles for Biking, Hiking and Driving for Pleasure, $ per party per day

	Bike, Hike, Drive	
Spending category	Non-Local	Local Day
Lodging	0.00	0.00
Restaurant	10.35	4.74
Groceries	4.61	2.75
Gas & oil	9.90	7.61
Other transp.	3.06	0.16
Activities	0.84	0.63
Admissions/fees	2.49	2.15
Souvenirs	2.10	0.66
Other	0.15	0.67
Total	**33.49**	**19.37**
N	311	1824
Std Dev. of Total	78	45
SE Mean of Total	4	1
Pct Err (95% level)	27%	11%

The activity-based spending profiles in Tables 9-13 may be used to evaluate alternatives involving specific activities or when the number of visitors in distinct activity groups is known. For example, the skier profiles may be applied to changes in skier visits, snowmobile profile to changes in visits from modifications of snowmobile trails, and the developed camping profiles to an increase or decrease in campground use.

Summary and Conclusion

This report has updated previous NVUM spending profiles using data gathered at an additional twenty-nine national forests in FY 2002. Compared to the first two years of NVUM surveys, there was a higher percentage of non-local overnight visitors and fewer local day trips on forests surveyed in FY 2002. Spending averages in FY 2002 decreased slightly for the non-local OVN-NF segment but increased for the non-local OVN segment. Overall, the spending average for all national forest visitors remained just below $100 per party per trip or $43 per person.

Spending patterns have remained reasonably consistent across the three years of NVUM surveys. Year to year differences in the national averages are likely explained by the mix of forests surveyed each year. Results based on the combined sample provide reliable estimates of the national averages.

Appendices to this report provide estimates for individual forests and illustrate how to apply the NVUM results at the forest level. Appendix B presents results for wildlife-related activities. Results for individual forests will be less reliable than the national averages and therefore should be used with caution. The number of usable cases for the economic analysis range from 33 cases on the Rio Grande National Forest to 528 on the Tonto National Forest (Table A-4). Sample sizes for specific trip types and activities at the forest level are much smaller and results can be quite sensitive to the NVUM case weights.

The NVUM questionnaire has been modified slightly for FY 2003. Revisions will provide a firmer basis for identifying local and non-local visitors based on reported driving distances. Visitors on overnight trips will be more clearly identified and we will be able to better distinguish lodging types and length of time spent in the local region, two key determinants of spending. The current OVN segments are a mix of visitors staying in resorts and campgrounds off the forest, visitors staying with friends and relatives or an owned seasonal home, and pass through travelers on extended overnight trips.

With the addition of NVUM surveys for FY 2003, a full cycle of surveys at all national forests will be completed. The combined results over the four years provide reliable estimates of spending for national forest visitors that can be used in evaluating management alternatives with respect to local and national economic impacts.

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Appendix A.

Supplemental Tables

Table A-1. Spending Averages by Forest and Day Versus Overnight Trip Segments, $ per party per trip

	Day Trips		Overnight Trips		Overall Spending Average	
Forest	Spending	N	Spending	N	Sample Average	Standardized
Above Average Spending Forests						
Apache-Sitgreaves	53	23	242	176	215	130
Ashley	50	48	188	99	139	106
Chequamegon-Nicolet	67	65	180	103	141	114
Chippewa	30	40	228	73	151	111
Coconino	55	65	203	92	150	116
Flathead	73	48	258	38	176	149
Inyo	36	37	235	283	195	117
Lake Tahoe Mgmt Unit	32	102	280	163	176	133
Rogue River	58	12	205	15	102	118
Routt	35	33	235	67	160	117
Sawtooth	37	37	217	76	156	110
Shasta-Trinity	36	70	235	112	153	117
Tongass	13	85	335	33	111	145
Tongass-Chatam	8	83	276	25	88	117
Wenatchee	65	104	158	104	114	103
White Mountain	95	30	217	92	185	145
White River	30	196	262	197	144	125
Average Spending Forests						
Allegheny	36	42	135	80	92	76
Beaverhead-Deerlodge	45	61	143	61	97	85
Bridger-Teton	19	167	174	121	86	82
Caribbean	41	18	110	51	91	69
Caribou-Targhee	60	55	146	109	120	95
Cherokee	20	83	159	85	87	77
Chugach	53	35	182	36	135	106
Cleveland	44	115	160	57	78	91
Columbia Gorge NSR	17	169	177	58	48	83
Coronado	28	166	148	80	71	77
Dakota Prairie	28	14	117	15	76	65
Deschutes	33	62	158	76	99	84
Fishlake	20	27	159	53	118	77
Fremont	40	28	140	43	98	81
Gifford-Pinchot	24	67	150	63	91	76
Gila	84	10	105	42	105	93
Green Mountain	27	65	168	47	89	85
Hiawatha	29	24	149	48	127	78
Humboldt-Toyiabe	25	32	177	31	87	87
Huron-Manistee	41	26	157	84	134	88
Kaibab	35	27	138	38	127	77
Land Between the Lakes	23	22	144	19	73	73
Lassen	31	17	221	61	158	109
Manti-Lasal	40	37	142	36	90	82
Nebraska	30	18	180	31	122	91
Nez Perce	69	15	108	19	96	85
NFS of Florida	64	50	123	23	78	88
NFS of Mississippi	48	30	121	57	95	78

Table A-1 (Continued). Spending Averages by Forest and Day Versus Overnight Trip Segments, $ per party per trip

	Day Trips		Overnight Trips		Overall Spending Average	
Forest	Spending	N	Spending	N	Sample Average	Standardized
NFS of North Carolina	31	53	203	93	145	102
Okanogan	42	19	184	69	137	100
Olympic	48	69	159	89	128	93
Ouachita	37	81	141	77	83	80
Ozark-St. Francis	35	54	183	59	120	95
Payette	43	37	150	49	101	87
Pike-San Isabel	33	130	146	91	87	79
Plumas	40	75	127	111	92	76
Rio Grande	27	9	271	20	247	127
San Juan	20	57	210	45	106	98
Sierra	58	57	146	119	119	94
Siskiyou	21	34	177	38	108	85
Siuslaw	30	32	201	54	138	100
Superior	33	17	169	43	114	89
Tahoe	32	163	155	172	85	83
Umpqua	34	33	185	68	132	96
Winema	24	20	160	15	89	79
Below Average Spending Forests						
Angeles	43	206	50	24	45	46
Arapaho-Roosevelt	26	153	115	79	66	63
Bighorn	41	52	103	81	72	66
Bitteroot	25	140	103	58	48	57
Boise	40	36	98	44	68	64
Cibola	28	128	106	41	58	60
Clearwater	41	36	102	56	82	66
Custer	20	36	86	36	66	47
Daniel Boone	37	81	100	100	69	63
Francis Marion &Sumter	28	99	129	32	53	70
GWJeff	52	97	97	75	70	70
Kisatchie	20	22	77	9	29	43
Klamath	28	39	102	33	59	58
Kootenai	31	101	120	74	74	68
Lewis and Clark	38	44	112	45	80	68
Lolo	18	96	102	23	40	52
Los Padre	17	126	119	46	43	59
Mark Twain	24	73	98	59	53	55
Medicine Bow	27	73	95	115	63	55
Mendocino	14	126	86	112	40	43
Modoc	27	13	52	31	44	37
Mt. Baker-Snoqualmie	24	129	58	71	37	38
Ochoco	20	9	127	25	94	64
Prescott	24	163	115	79	51	61
Shawnee	26	64	112	72	73	61
Tonto	33	358	109	187	58	64
Uinta	27	265	122	89	48	66
Willamette	46	159	107	172	77	71
National Average	**33**	**6424**	**162**	**6352**	**96**	**86**

[a] A standardized average is computed using a fixed mix of day trips (59%) and overnight trips (41%) for each forest.

Table A-2. Full Information Segment Shares by Forest

	Non-Local Segments			Local Segments				
Forest	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
All Forests	8%	7%	20%	45%	5%	8%	7%	100%
Allegheny	4%	6%	29%	50%	2%	6%	3%	100%
Angeles	9%	0%	1%	81%	5%	4%	0%	100%
Apache-Sitgreaves	3%	42%	34%	9%	4%	6%	2%	100%
Arapaho-Roosevelt	5%	2%	10%	54%	8%	11%	10%	100%
Ashley	16%	20%	25%	17%	5%	7%	10%	100%
Beaverhead-Deerlodge	2%	11%	6%	40%	6%	22%	14%	100%
Bighorn	9%	8%	15%	34%	8%	11%	17%	100%
Bitteroot	10%	2%	5%	63%	9%	8%	3%	100%
Boise	7%	1%	1%	65%	13%	13%	1%	100%
Bridger-Teton	9%	7%	16%	51%	3%	7%	7%	100%
Caribbean	5%	0%	44%	2%	0%	20%	29%	100%
Caribou-Targhee	0%	4%	11%	57%	12%	7%	9%	100%
Chequamegon-Nicolet	17%	5%	36%	34%	2%	3%	4%	100%
Cherokee	11%	3%	3%	55%	18%	2%	8%	100%
Chippewa	5%	16%	17%	53%	3%	5%	1%	100%
Chugach	3%	0%	4%	50%	5%	1%	36%	100%
Cibola	5%	0%	18%	59%	3%	7%	8%	100%
Clearwater	12%	21%	3%	21%	20%	9%	13%	100%
Cleveland	0%	1%	7%	79%	6%	3%	4%	100%
Coconino	16%	7%	24%	30%	2%	4%	16%	100%
Columbia Gorge NSR	5%	2%	6%	71%	1%	2%	13%	100%
Coronado	7%	5%	9%	62%	4%	7%	5%	100%
Custer	32%	11%	17%	31%	2%	0%	8%	100%
Dakota Prairie	4%	7%	14%	48%	1%	18%	8%	100%
Daniel Boone	8%	11%	7%	62%	9%	3%	0%	100%
Deschutes	5%	11%	19%	42%	4%	8%	10%	100%
Fishlake	9%	20%	16%	30%	5%	12%	7%	100%
Flathead	0%	2%	15%	56%	3%	20%	5%	100%
Francis Marion & Sumter	7%	4%	5%	69%	4%	8%	2%	100%
Fremont	17%	14%	20%	30%	12%	6%	1%	100%
Gifford-Pinchot	12%	7%	17%	40%	6%	7%	10%	100%
Gila	1%	11%	22%	23%	5%	16%	22%	100%
Green Mountain	16%	4%	18%	50%	3%	6%	3%	100%
GWJeff	2%	5%	5%	72%	4%	6%	7%	100%
Hiawatha	1%	4%	31%	32%	2%	8%	22%	100%
Humboldt-Toyiabe	1%	4%	29%	53%	5%	2%	7%	100%
Huron-Manistee	19%	5%	44%	24%	2%	5%	1%	100%
Inyo	2%	11%	61%	16%	0%	1%	9%	100%
Kaibab	7%	12%	24%	33%	1%	2%	22%	100%
Kisatchie	2%	1%	0%	96%	0%	0%	0%	100%
Klamath	2%	9%	12%	56%	4%	7%	10%	100%
Kootenai	10%	4%	8%	49%	3%	17%	9%	100%
Lake Tahoe Mgmt Unit	9%	2%	48%	28%	1%	2%	11%	100%
Land Between the Lakes	9%	13%	13%	51%	11%	2%	2%	100%
Lassen	3%	15%	26%	38%	4%	7%	7%	100%
Lewis and Clark	11%	7%	19%	38%	11%	8%	5%	100%
Lolo	4%	3%	10%	70%	5%	5%	3%	100%
Los Padre	12%	3%	5%	70%	5%	2%	3%	100%
Manti-Lasal	2%	6%	3%	40%	4%	9%	36%	100%

Table A-2 (Continued). Full Information Segment Shares by Forest

	Non-Local Segments			Local Segments				
Forest	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
Mark Twain	6%	5%	1%	77%	7%	1%	3%	100%
Medicine Bow	10%	15%	13%	38%	10%	7%	7%	100%
Mendocino	27%	17%	5%	47%	4%	1%	0%	100%
Modoc	4%	5%	8%	51%	5%	19%	9%	100%
Mt. Baker-Snoqualmie	7%	5%	11%	44%	3%	22%	8%	100%
Nebraska	2%	16%	17%	41%	3%	2%	19%	100%
Nez Perce	8%	18%	33%	28%	0%	2%	10%	100%
NFS of Florida	5%	8%	5%	67%	0%	7%	8%	100%
NFS of Mississippi	1%	3%	3%	64%	7%	20%	3%	100%
NFS of North Carolina	9%	5%	24%	38%	5%	13%	7%	100%
Ochoco	0%	17%	10%	30%	18%	24%	1%	100%
Okanogan	2%	8%	50%	29%	5%	1%	6%	100%
Olympic	1%	2%	11%	53%	6%	9%	18%	100%
Ouachita	2%	6%	9%	67%	7%	3%	6%	100%
Ozark-St. Francis	8%	2%	24%	33%	2%	26%	4%	100%
Payette	26%	14%	23%	29%	3%	1%	4%	100%
Pike-San Isabel	6%	2%	12%	50%	3%	17%	11%	100%
Plumas	11%	9%	11%	50%	8%	6%	6%	100%
Prescott	17%	8%	9%	57%	4%	4%	2%	100%
Rio Grande	3%	4%	7%	38%	1%	19%	28%	100%
Rogue River	2%	3%	9%	35%	6%	23%	23%	100%
Routt	3%	9%	40%	35%	1%	4%	8%	100%
San Juan	4%	8%	22%	38%	5%	11%	11%	100%
Sawtooth	9%	8%	17%	42%	9%	11%	4%	100%
Shasta-Trinity	4%	15%	15%	37%	9%	14%	7%	100%
Shawnee	12%	5%	15%	46%	4%	11%	6%	100%
Sierra	8%	19%	14%	29%	9%	18%	2%	100%
Siskiyou	1%	3%	14%	46%	13%	10%	14%	100%
Siuslaw	10%	20%	14%	38%	3%	1%	13%	100%
Superior	2%	14%	24%	49%	4%	3%	4%	100%
Tahoe	7%	4%	29%	43%	3%	5%	9%	100%
Tongass	0%	3%	27%	53%	1%	4%	11%	100%
Tongass-Chatam	1%	0%	23%	63%	2%	7%	5%	100%
Tonto	9%	4%	1%	60%	22%	3%	1%	100%
Uinta	9%	2%	2%	66%	11%	5%	5%	100%
Umpqua	2%	13%	8%	36%	13%	11%	16%	100%
Wenatchee	17%	5%	21%	27%	3%	25%	2%	100%
White Mountain	10%	15%	49%	20%	1%	3%	3%	100%
White River	13%	2%	58%	20%	1%	4%	3%	100%
Willamette	15%	10%	9%	44%	7%	6%	8%	100%
Winema	5%	5%	22%	46%	11%	11%	1%	100%

NOTE: The full information segment shares are computed using NVUM case weights and some information from the general portion of the NVUM survey. Questions for distinguishing day and overnight trips and to identify non-primary purpose trips were only asked on the economics portion of the survey.

Table A-3. People per Vehicle by Segment by Forest[a]

	Non-Local Segments			Local Segments				
Forest	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
Allegheny		2.3	2.5	1.8				2.1
Angeles	2.9			2.4				2.5
Apache-Sitgreaves		2.9	2.8	2.2				2.7
Arapaho-Roosevelt	2.5		4.4	1.9	2.4	2.9	2.6	2.3
Ashley	2.8	2.9	2.2	2.0			2.3	2.5
Beaverhead-Deerlodge		2.9		2.3	3.2			2.8
Bighorn		1.8	2.5	2.4			2.5	2.4
Bitteroot	3.8			2.0	2.2			2.2
Boise				2.1	2.4			2.5
Bridger-Teton	1.9	2.6	2.3	2.3		2.4	2.9	2.4
Caribbean			2.4					2.6
Caribou-Targhee			2.1	2.0	2.3	2.6	2.9	2.1
Chequamegon-Nicolet	1.7	2.6	2.6	2.0			2.5	2.3
Cherokee		1.9		2.2	2.3			2.2
Chippewa		2.1	2.7	1.9				2.1
Chugach				2.5			3.5	2.7
Cibola			3.2	2.3			3.6	2.6
Clearwater		3.0		2.6				2.5
Cleveland				2.3	2.5			2.1
Coconino	2.5	2.7	2.6	1.4			2.2	2.1
Columbia Gorge NSR	2.5		2.6	2.4			2.5	2.4
Coronado	2.2		2.5	2.0	2.4			2.1
Custer	2.7	3.0						2.7
Dakota Prairie								2.5
Daniel Boone	2.7	2.4		1.7	2.4			2.0
Deschutes		2.2	2.6	1.9			2.9	2.3
Fishlake		2.9	2.6	2.0				2.3
Flathead				1.9				2.3
Francis Marion and Sumter	2.5			1.9				2.0
Fremont				2.1				2.3
Gifford-Pinchot	2.4		2.9	2.6	2.1		2.8	2.5
Gila			2.4					2.1
Green Mountain			2.2	2.3				2.1
GWJeff			1.5	1.6		2.9		1.8
Hiawatha			2.3	1.5			2.4	2.2
Humboldt-Toyiabe				2.3				2.6
Huron-Manistee			2.4	1.8		2.1		2.2
Inyo		2.3	2.5	1.2			2.3	2.3
Kaibab			3.5	2.3			2.8	2.8
Kisatchie				2.4				2.4
Klamath				1.6				1.7
Kootenai		2.3	4.0	2.3		1.8	2.6	2.5
Lake Tahoe Mgmt Unit	1.8	2.4	2.5	1.7			2.8	2.2
Land Between the Lakes				2.3				2.3
Lassen		2.7	2.5					2.6
Lewis and Clark				2.2				2.5

Table A-3 (Continued). People per Vehicle by Segment by Forest[a]

	Non-Local Segments			Local Segments				
Forest	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
Lolo				1.9				1.9
Los Padre	2.2			1.7				1.8
Manti-Lasal				2.2				2.6
Mark Twain		2.2		2.2				2.3
Medicine Bow	1.9	2.6	3.0	1.9	2.8		1.5	2.3
Mendocino	1.8	2.6	2.7	1.9				2.0
Modoc								2.7
Mt. Baker-Snoqualmie	2.0			2.7	2.3	2.1	2.4	2.8
Nebraska		2.4		2.3				2.7
Nez Perce								2.4
NFS of Florida				2.4				2.5
NFS of Mississippi		2.0		1.6	2.5	1.9		1.7
NFS of North Carolina		2.6	2.3	1.6		2.8	2.7	2.1
Ochoco								1.9
Okanogan		2.6	2.4					2.2
Olympic			2.5	1.8	2.7	2.6	2.5	2.1
Ouachita		2.5	1.4	2.3				2.3
Ozark-St. Francis			4.0	2.5		1.8		2.5
Payette	2.1	2.0	3.6	2.4				2.4
Pike-San Isabel			3.1	1.6		2.6	2.0	2.0
Plumas		2.5	2.2	2.2	2.4	2.2		2.3
Prescott	2.1	2.9	2.4	1.7				2.0
Rio Grande								2.5
Rogue River							2.7	2.7
Routt		1.7	2.2	3.1				2.6
San Juan		3.0	2.5	1.9			2.7	2.2
Sawtooth		3.1	2.3	1.8		2.9		2.4
Shasta-Trinity		2.2	2.4	2.6	3.2		2.8	2.6
Shawnee	2.8	3.1	2.8	2.4		3.1		2.6
Sierra		2.6	3.9	2.6	2.1	2.4		2.7
Siskiyou				2.6				2.6
Siuslaw		3.1	2.1	2.7			3.4	2.6
Superior			2.9					2.1
Tahoe	1.5	2.5	2.1	1.7	2.4	2.8	1.8	1.9
Tongass			2.6	2.3				2.4
Tongass-Chatam			2.5	1.8				2.0
Tonto	2.3	2.1	3.0	2.3	3.1	3.2		2.4
Uinta	2.7			2.4	3.7	2.4	2.5	2.6
Umpqua		2.8		2.3	2.5		2.3	2.4
Wenatchee	2.8	2.1	3.4	2.2		3.6		2.9
White Mountain		2.0	3.3	2.3				2.6
White River	2.2	1.9	2.7	1.7	2.0	2.2	2.3	2.2
Willamette	2.5	2.4	2.5	2.3	2.4	2.4	2.4	2.4
Winema				2.3				2.7
National Average	**2.3**	**2.5**	**2.7**	**2.1**	**2.5**	**2.4**	**2.6**	**2.3**

[a] If a forest has less than 15 cases in a segment the value is left blank. In these cases the national average at the bottom of the column may be used.

Table A-4. Economic Sub-Sample Size by Forest and Segment[a]

	Non-Local Segments			Local Segments				
Forest	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
Allegheny	6	17	47	35	4	10	6	125
Angeles	20		2	177	7	13	1	220
Apache-Sitgreaves	8	96	61	15	5	9	5	199
Arapaho-Roosevelt	15	7	16	135	18	38	32	261
Ashley	27	37	36	18	7	13	20	158
Beaverhead-Deerlodge	4	15	13	54	17	13	9	125
Bighorn	13	36	24	37	8	11	39	168
Bitteroot	21	9	8	114	29	11	12	204
Boise	3	4	3	31	25	12	1	79
Bridger-Teton	25	41	43	137	12	20	51	329
Caribbean	2		19	6		3	10	40
Caribou-Targhee	4	6	33	50	24	41	23	181
Chequamegon-Nicolet	15	28	53	48	12	8	16	180
Cherokee	14	15	9	66	53	3	7	167
Chippewa	6	32	23	33	3	5	3	105
Chugach	7	1	5	22	8	3	21	67
Cibola	10		25	116	3	12	18	184
Clearwater	14	16	13	21	8	12	9	93
Cleveland	4	4	11	105	29	8	7	168
Coconino	19	18	55	45	8	6	22	173
Columbia Gorge NSR	22	13	28	141	6	9	43	262
Coronado	20	13	17	144	33	13	10	250
Custer	21	22	9	12	4		9	77
Dakota Prairie	2	2	4	11	4	4	2	29
Daniel Boone	15	53	14	64	23	6	3	178
Deschutes	6	29	32	54	7	5	17	150
Fishlake	7	22	15	19	8	8	6	85
Flathead	1	5	12	42	8	11	14	93
Francis Marion and Sumter	18	8	10	77	8	4	8	133
Fremont	2	14	11	26	9	6	4	72
Gifford-Pinchot	20	6	29	42	15	11	20	143
Gila	4	6	20	5	3	6	9	53
Green Mountain	10	8	27	53	3	9	6	116
GWJeff	4	11	15	87	13	23	5	158
Hiawatha	1	9	28	20	3	6	23	90
Humboldt-Toyiabe	1	2	12	31	8	5	6	65
Huron-Manistee	10	12	46	15	8	15	3	109
Inyo	10	126	134	27	5	6	61	369
Kaibab	8	7	24	19	2	4	37	101
Kisatchie	2	2	1	18	3	2	1	29
Klamath	1	8	10	35	7	7	6	74
Kootenai	12	15	15	89	7	36	15	189
Lake Tahoe Mgmt Unit	28	22	121	73	6	13	38	301
Land Between the Lakes	3	9	3	17	1	4	4	41
Lassen	3	16	24	13	12	5	7	80
Lewis and Clark	12	6	14	29	11	12	9	93
Lolo	8	7	5	86	5	6	5	122
Los Padre	15	8	8	102	13	9	5	160

Table A-4 (Continued). Economic Sub-Sample Size by Forest and Segment[a]

	Non-Local Segments			Local Segments				
Forest	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
Manti-Lasal	6	9	10	30	8	9	14	86
Mark Twain	11	31	9	60	13	5	6	135
Medicine Bow	17	43	30	53	21	14	16	194
Mendocino	53	84	15	70	8	1	2	233
Modoc	2	14	6	11	6	4	7	50
Mt. Baker-Snoqualmie	17	4	12	106	20	33	19	211
Nebraska	2	16	12	16	1	1	9	57
Nez Perce	3	5	13	12		1	4	38
NFS of Florida	8	1	10	40		10	4	73
NFS of Mississippi	4	18	5	23	17	16	2	85
NFS of North Carolina	12	15	41	39	12	24	19	162
Ochoco		6	7	6	3	8	2	32
Okanogan	5	24	36	13	6	3	13	100
Olympic	4	11	23	59	22	31	43	193
Ouachita	14	39	23	66	11	4	5	162
Ozark-St. Francis	6	6	31	47	5	15	6	116
Payette	15	25	16	20	5	1	6	88
Pike-San Isabel	13	7	25	109	13	37	26	230
Plumas	14	26	27	60	32	24	12	195
Prescott	39	37	18	118	14	6	5	237
Rio Grande	1	8	5	5	3	2	9	33
Rogue River	3	4	1	9	5	5	18	45
Routt	4	20	33	27	3	10	12	109
San Juan	5	15	17	51	2	11	19	120
Sawtooth	7	25	24	28	8	16	8	116
Shasta-Trinity	11	51	27	55	19	11	17	191
Shawnee	17	17	30	47	6	17	5	139
Sierra	11	48	23	44	29	18	6	179
Siskiyou	1	8	7	31	14	9	11	81
Siuslaw	7	20	21	25	10	1	28	112
Superior	2	14	22	13	4	3	5	63
Tahoe	32	60	65	129	25	22	20	353
Tongass	1	3	19	84	3	8	4	122
Tongass-Chatam	5		21	77		3	5	111
Tonto	36	34	18	300	104	25	11	528
Uinta	31	8	9	227	48	21	20	364
Umpqua	2	27	8	29	20	7	17	110
Wenatchee	43	28	42	56	14	19	3	205
White Mountain	9	40	39	18	1	6	8	121
White River	53	34	121	141	21	18	24	412
Willamette	48	71	34	110	49	17	36	365
Winema	2	3	6	18	2	4	2	37
Total	**1079**	**1802**	**2148**	**5098**	**1122**	**996**	**1196**	**13,441**

[a] Excludes outliers and cases with missing Zip codes.

Table A-5. Trip Segment Distribution by Primary Activity[a]

	Non-Local Segments			Local Segments				
Primary Activity	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
National Average Segment Share	8%	7%	20%	45%	5%	8%	7%	100%
Biking	6%	1%	16%	62%	4%	5%	6%	100%
Boating[b]	9%	11%	16%	40%	11%	9%	3%	100%
Cross-country skiing	11%	3%	32%	50%	1%	2%	1%	100%
Developed Camping	0%	29%	16%	2%	30%	16%	7%	100%
Downhill skiing	14%	0%	38%	36%	0%	9%	2%	100%
Driving	6%	1%	6%	75%	0%	3%	9%	100%
Fishing	9%	11%	12%	52%	7%	6%	3%	100%
General/Relaxing	7%	19%	13%	36%	11%	9%	6%	100%
Hiking	8%	3%	13%	63%	2%	5%	6%	100%
Hunting	5%	12%	6%	52%	8%	15%	2%	100%
No primary activity	10%	14%	11%	31%	7%	15%	11%	100%
Nature-related[b]	9%	2%	24%	42%	1%	6%	16%	100%
Multiple primary activities	4%	17%	17%	43%	8%	5%	5%	100%
OHV use[b]	11%	8%	13%	50%	6%	6%	4%	100%
Other[b]	8%	3%	7%	58%	6%	11%	8%	100%
Other non-motorized	11%	2%	8%	75%	2%	1%	1%	100%
Picnic	5%	2%	11%	60%	1%	6%	14%	100%
Prim. Camp/Backpacking	0%	27%	17%	4%	31%	17%	3%	100%
Resort	3%	20%	14%	9%	21%	22%	11%	100%
Snowmobile	8%	2%	11%	55%	6%	8%	10%	100%

[a] Excludes cases with missing Zip codes, case weighted using economic subsample.
[b] "Nature-related" activities include viewing wildlife, viewing natural features, nature study, visiting a nature center, or viewing forest. "OHV use" also includes other motorized activity. "Boating" combines motorized and non-motorized boating. The "other" category includes gathering, visiting historic sites, and horseback riding.

Table A-6. Participation in Recreation Activities and Primary Activity on the Trip

	Primary Activity		Activity Participation	
Recreation Activity	Number of cases	Percentage[a]	Number of Cases	Percentage[a]
Hiking	11,228	14%	31,529	39%
Downhill skiing	2,681	14%	3,047	15%
Nature-related[b]	7,284	10%	43,230	60%
Hunting	3,149	8%	3,940	10%
Fishing	5,327	8%	11,698	15%
General/Relaxing	5,731	7%	30,632	38%
Developed Camping	4,439	4%	11,951	11%
Driving	2,063	4%	16,595	24%
Multiple primary activities	2,638	4%	---	0%
No primary activity	2,004	4%	---	0%
Other non-motorized	2,092	3%	7,511	9%
Cross-country skiing	1,244	3%	1,733	4%
Other activity[b]	1,730	3%	10,829	13%
Biking	1,505	3%	3,960	5%
OHV use[b]	1,553	3%	4,295	7%
Picnic	1,794	2%	11,734	13%
Prim. camp/Backpacking	2,100	2%	7,100	9%
Snowmobile	1,270	2%	1,532	3%
Boating[b]	1,580	2%	5,384	6%
Resort	543	1%	2,968	3%
Total	61,955	100%	61,955	100%

[a] Percentages estimated with case weights on full sample.

[b] "Nature-related" activities include viewing wildlife, viewing natural features, nature study, visiting a nature center, or viewing forest. "OHV use" also includes other motorized activity. "Boating" combines motorized and non-motorized boating. The "other" category includes gathering, visiting historic sites, and horseback riding.

Appendix B.

Spending Profiles of Wildlife-Related National Forest Visitors

This Appendix presents two sets of spending profiles for national forest visitors. One set is for visitors whose primary activity on the forest was wildlife-related. The other set is for visitors whose primary activity was one of 23 other general recreation activities (non-wildlife-related). This classification of recreation activities is useful for a programmatic analysis for which the primary goal is to evaluate the economic contribution of wildlife-related recreation. Estimates are based on the National Forest Visitor Use Monitoring Project (NVUM) data for years 2000, 2001 and 2002.

Wildlife-related visitors were identified by their response to two questions on the NVUM Survey: "What activities have you participated in while on this visit?" and "Of these, which was your primary recreation activity?". Respondents who selected viewing wildlife, hunting, or fishing were considered wildlife-related visitors.

Forty-eight percent of NVUM respondents participated in a wildlife-related activity during their visit (Table B-1). Thirty-three percent of NVUM respondents engaged in wildlife viewing, 19 percent fished, and six percent hunted. Fifteen percent of visitors

Table B-1. Participation in Wildlife-Related Recreation by NVUM Respondents

	All Respondents	Any Wildlife-Related	Viewing Wildlife	Fishing	Hunting
All NVUM Cases 2000, 2001, & 2002					
Participated, N [a]	61,955	29,839	20,419	11,699	3,940
Raw Percent	*100%*	*48%*	*33%*	*19%*	*6%*
Case Weights		*41%*	*24%*	*15%*	*10%*
Primary Activity, N[a]	61,955	9,231	755	5,327	3,149
Raw Percent	*100%*	*15%*	*1%*	*9%*	*5%*
Case Weights		*17%*	*1%*	*8%*	*8%*
Economic Subsample					
Years 2000-2002, Primary Activity, N[a]	15,092	2,193	183	1,286	724
Raw Percent	*100%*	*15%*	*1%*	*9%*	*5%*
Case Weights		*15%*	*1%*	*9%*	*5%*
Years 2001 and 2002 Primary activity, Raw Percent		16%	2%	9%	5%

[a] Three-year data underestimates viewing wildlife as this activity was not included during the first year of NVUM sampling.

stated that their primary activity during their visit was wildlife-related. Only one percent of visitors stated viewing wildlife as their primary activity, while nine percent stated fishing and five percent stated hunting was their primary activity. Using the case weights

yields minor changes in the percentage of visitors classified as wildlife-related. Only respondents to the economic portion of the survey who stated their primary recreation activity was wildlife-related are used in the subsequent analysis[17].

"Viewing wildlife" was not included in the list of activities in the first year of NVUM sampling so the three-year sample underestimates the percentage of wildlife viewers. Based on the data from years 2001 and 2002, 16 percent of national forest visitors came primarily for a wildlife-related activity, two percent of these were wildlife viewing, nine percent were fishing and five percent were hunting.

Spending Profiles by Trip Segments

Wildlife-related visitors spent about four percent less per trip, than other visitors—$96 per visit for wildlife-related visitors compared to $100 for non-wildlife-related visitors (Table B-2). Higher total spending by non-wildlife visitors results primarily from a higher percentage of non-wildlife visitors in the non-local OVN and non-primary purpose trip segments. Wildlife-related visitors in the OVN-NF, non-local OVN, and local day trip segments spent more per trip than non-wildlife visitors.

Table B-2. Comparison of Wildlife-Related and Non-Wildlife-Related Visitor Spending

	Non-Local Segments			Local Segments				
Spending category	Day	OVN-NF	OVN	Day	OVN-NF	Non-OVN	Non-Primary	Total[a]
Spending per party per trip								
Wildlife-related	$40	$199*	$228	$41*	$140*	$93	$190	$96
Non-wildlife-related	$52	$145*	$224	$28*	$105*	$101	$172	$100
Full Information Segment Shares[b]								
Wildlife-related	6%	10%	11%	51%	9%	10%	3%	100%
Non-wildlife-related	8%	6%	22%	44%	5%	8%	7%	100%
Spending per night on the NF								
Wildlife-related		$ 55			$ 44			
Non-wildlife-related		$ 60			$ 50			

* Averages that are statistically different (95% confidence level) are designated by an asterisk.
[a] Spending averages are computed as a weighted average of the columns using the full information segment shares.
[b] The full information segment shares are computed using NVUM case weights and some information from cases that did not complete the economics portion of the survey.

The higher spending for the OVN-NF segments is mostly explained by longer stays of wildlife-related visitors. On a per night basis wildlife-related visitors in both segments spent less than non-wildlife related visitors. However, local visitors on day trips spent

[17] The patterns of wildlife-related recreation participation in the economic sub-sample are similar to that of the general sample.

significantly more if their primary activity was wildlife-related, even after taking into account slightly longer stays.

Tables B-3 and B-4 provide the detailed spending patterns for wildlife-related and non-wildlife-related visitors, respectively. The profiles for non-wildlife-related visitors will be similar to the overall national averages. The slightly higher spending by wildlife-related visitors in some trip segments is due primarily to higher spending on gas and oil, and groceries.

Table B-3. Wildlife-related Visitor Spending by Trip Type Segment and Spending Category, $ per party per trip[a]

	Non-Local Segments			Local Segments				
Spending category	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	All Visits[b]
Public Lodging	0.00	10.14	6.28	0.00	5.50	1.00	2.90	2.37
Private Lodging	0.00	17.38	47.32	0.00	5.81	8.03	40.81	9.47
Restaurant	8.30	33.26	56.08	6.53	18.16	17.31	38.35	17.77
Groceries	7.27	43.31	28.91	8.10	43.97	16.92	19.43	18.26
Gas & oil	16.04	51.04	42.89	15.40	34.61	30.89	32.26	25.78
Other transp.	0.00	3.16	1.36	0.02	0.78	0.18	1.60	0.61
Activities	2.53	7.94	21.94	1.75	4.12	4.62	23.71	5.81
Admissions/fees	2.86	9.32	6.69	3.12	6.51	3.48	6.14	4.55
Souvenirs	0.58	7.87	6.90	1.91	7.80	2.27	9.49	3.77
Other	2.10	15.18	9.43	4.33	12.66	8.35	15.74	7.37
Total	**39.69**	**198.59**	**227.80**	**41.16**	**139.93**	**93.05**	**190.44**	**95.77**
N(unwtd)	154	328	292	759	176	170	82	1,961
Std. Dev. of Total	63	208	212	78	154	146	240	171
SE Mean of Total	5	11	12	3	12	11	26	4
Pct Error (95% level)	25%	12%	11%	14%	17%	24%	28%	8%

[a] Outliers are excluded and exposure weights are applied in estimating spending averages.
[b] All visits averages computed as a weighted average across columns using full information segment computed for wildlife related visitors only (Table B-2).

Table B-4. Non-Wildlife Related Visitor Spending by Trip Type Segment and Spending Category, $ per party per trip[a]

	Non-Local Segments			Local Segments				
Spending category	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	All Visits[b]
Public Lodging	0.00	4.81	3.57	0.00	2.90	2.77	5.49	1.82
Private Lodging	0.00	12.42	55.24	0.00	5.90	11.16	38.62	16.84
Restaurant	14.40	25.24	53.92	6.14	14.20	19.08	41.81	22.42
Groceries	7.09	31.83	28.37	4.44	35.33	20.29	18.69	15.23
Gas & oil	15.66	32.42	29.48	10.43	24.01	21.26	26.12	18.95
Other transp.	1.62	4.56	10.35	0.33	0.19	1.37	7.27	3.47
Activities	3.56	7.76	12.14	1.49	3.51	6.57	8.74	5.38
Admissions/fees	5.21	12.91	8.75	3.00	12.06	8.95	6.10	6.13
Souvenirs	2.38	5.55	13.58	1.06	1.90	3.54	13.76	5.35
Other	2.17	7.60	8.44	1.25	5.35	5.65	5.29	4.10
Total	**52.07**	**145.11**	**223.82**	**28.13**	**105.36**	**100.63**	**171.89**	**99.71**
N(unwtd)	925	1,474	1,856	4,339	946	826	1,114	11,480
Std. Dev. of Total	91	188	244	55	124	141	220	172
SE Mean of Total	3	5	6	1	4	5	7	2
Pct Error (95% level)	11%	7%	5%	6%	8%	10%	8%	3%

[a] Outliers are excluded and exposure weights are applied in estimating spending averages.
[b] All visits averages computed as a weighted average across columns using full information segment computed for non-wildlife related visitors only (Table B-2).

Wildlife-related Visitor Trip and Party Characteristics

Visitors whose primary activity is wildlife-related have smaller than average party sizes and are less likely to include children in the party (Table B-5). Wildlife-related visitors staying overnight on the national forest have longer stays, averaging at least an extra night compared to OVN-NF visitors in general.

The percentage of visitor parties whose primary activity is wildlife-related varies across forests (Table B-6). For some forests, however, the results are quite sensitive to the choice of weighting scheme. For example, the raw percentage of visitors to Land Between the Lakes classified as wildlife-related is 45%, but this estimate drops to 27% when case weights are applied. Conversely, 17% of the NVUM visitors sampled on the Ouchita National Forest were wildlife-related visitors, but after case weighting, Ouchita has one of the highest shares of wildlife-related visitors (49%). Figures in Table B-6 should be used cautiously if the weighted and unweighted estimates are very different. The percentage of the NVUM sample classified as wildlife-related on each forest depends somewhat on the relative proportion of sitedays assigned to distinct locations and seasons that may differentially attract wildlife-related visitors.

The likelihood that a wildlife-related activity was identified as the primary activity should also be considered. While most trips involving hunting identified hunting as the primary activity, only about half of the trips in which someone in the party fished identified angling as the primary activity, and less than 5% of trips involving wildlife viewing identified it as the primary activity (Table B-1). The percentage of visitors identified as wildlife-related is therefore sensitive to the proportions of wildlife viewers and anglers on each forest who identify the activity as their primary one.

Table B-5. Comparison of Visitor Party Characteristics: Wildlife-Related and Non-Wildlife-Related Visitors

		Non-Local Segments			Local Segments				
Characteristic	Wildlife-related	Day	OVN-NF	OVN	DAY	OVN-NF	OVN	Non-Primary	Total
Segment Share[a]	Yes	6%	10%	11%	51%	9%	10%	3%	100%
	No	8%	6%	22%	44%	5%	8%	7%	100%
Days away from Home[b]	Yes		4.7	5.2		3.3	2.3	5.5	1.7
	No		4.1	4.9		2.5	2.5	7.3	2.0
People per Vehicle[b]	Yes	2.0	2.1	2.3	1.9	2.1	2.2	2.0	2.0
	No	2.4	2.6	2.7	2.1	2.6	2.5	2.6	2.4
Children Under 16[b]	Yes	0.2	0.2	0.4	0.3	0.3	0.4	0.7	0.3
	No	0.3	0.6	0.5	0.3	0.7	0.6	0.5	0.4
Nights on the National Forest[b]	Yes		3.6			3.2		2.5	2.3
	No		2.4			2.1		1.0	1.4

[a] Based on full-information segment shares computed using NVUM case weights and some information from cases that did not complete the economics portion of the survey.
[b] Outliers and cases with missing Zip codes excluded, case weighted.

Table B-6. Percentage of Wildlife-Related Visits by Forest

Forest	Un-weighted	Case Weights
National Average	15%	17%
Allegheny	24%	43%
Angeles	7%	8%
Apache-Sitgreaves	18%	21%
Arapaho-Roosevelt	11%	8%
Ashley	29%	36%
Beaverhead-Deerlodge	39%	34%
Bighorn	17%	26%
Bitteroot	10%	18%
Boise	15%	17%
Bridger-Teton	11%	11%
Caribbean	0%	0%
Caribou-Targhee	7%	28%
Chequamegon-Nicolet	31%	38%
Cherokee	13%	30%
Chippewa	50%	55%
Chugach	35%	30%
Cibola	6%	7%
Clearwater	16%	18%
Cleveland	7%	10%
Coconino	6%	8%
Columbia Gorge NSR	2%	2%
Coronado	8%	9%
Custer	20%	31%
Dakota Prairie	39%	40%
Daniel Boone	16%	32%
Deschutes	22%	17%
Fishlake	50%	55%
Flathead	19%	18%
Francis Marion and Sumter	31%	38%
Fremont	38%	43%
Gifford-Pinchot	10%	16%
Gila	14%	24%
Green Mountain	11%	8%
GWJeff	22%	36%
Hiawatha	9%	22%
Humboldt-Toyiabe	8%	12%
Huron-Manistee	28%	28%
Inyo	21%	13%
Kaibab	9%	15%
Kisatchie	13%	20%
Klamath	19%	11%
Kootenai	21%	36%
Lake Tahoe Mgmt Unit	2%	4%
Land Between the Lakes	45%	27%
Lassen	26%	22%
Lewis and Clark	24%	30%
Lolo	12%	20%
Los Padre	7%	12%

Table B-6 (Continued). Percentage of Wildlife-Related Visits by Forest.

Forest	Un-weighted	Case Weights
Manti-Lasal	21%	17%
Mark Twain	10%	21%
Medicine Bow	19%	21%
Mendocino	13%	17%
Modoc	29%	20%
Mt Baker-Snoqualmie	4%	2%
Nebraska	21%	20%
Nez Perce	14%	24%
NFS of Florida	5%	29%
NFS of Mississippi	31%	70%
NFS of North Carolina	9%	13%
Ochoco	17%	22%
Okanogan	4%	6%
Olympic	9%	14%
Ouachita	17%	49%
Ozark-St. Francis	18%	29%
Payette	27%	25%
Pike San Isabel	10%	14%
Plumas	24%	21%
Prescott	12%	14%
Rio Grande	16%	16%
Rogue River	13%	18%
Routt	15%	11%
San Juan	13%	16%
Sawtooth	5%	6%
Shasta Trinity	16%	30%
Shawnee	10%	15%
Sierra	11%	9%
Siskiyou	7%	8%
Siuslaw	15%	10%
Superior	29%	24%
Tahoe	12%	8%
Tongass	21%	31%
Tongass-Chatam	4%	4%
Tonto	16%	22%
Uinta	20%	21%
Umpqua	20%	25%
Wenatchee	8%	11%
White Mountain	1%	1%
White River	9%	2%
Willamette	16%	18%
Winema	18%	38%

Appendix C.

Applying the National Spending Profiles

This Appendix illustrates how to apply the spending profiles to estimate visitor spending or economic impacts for a given problem. This material was included in the previous report summarizing spending profiles based on the first two years of NVUM data. Figures in the illustrative applications to the Hiawatha NF vary slightly from the earlier ones. Differences are due to small changes in the national spending averages based on three years of data and modifications to procedures for identifying local visitors using Zip codes.

The spending profiles reported above can be used in national, regional, forest and sub-forest level planning. For economic impact analyses, the spending profiles must be combined with (1) estimates of visits, (2) estimates of the percentage of visits within given trip or activity segments, and (3) appropriate local input-output models or multipliers.

For national, regional and forest level estimates, the number of visits and trip segment shares may be derived from the NVUM survey or other sources[18]. The NVUM estimates will be most reliable at the national level, with increasing potential errors at regional and forest levels. Other local sources will often be more reliable in estimating the number of visitors within particular activity subgroups or for sub-forest level analysis.

The NVUM spending categories were developed to easily bridge to sectors in input-output models estimated with IMPLAN[19], so the application of the spending data to I-O models is reasonably straightforward. For most applications, the estimation of visits and segment shares will be the greater problem.

The general steps for making spending and economic impact estimates with the NVUM spending profiles are:

1. Choose a set of visitor segments. When analyzing spending by all visitors to a particular forest, we recommend using the seven trip segments. When conducting more targeted analyses, one or more of the activity-based segments may be used. We suggest using the trip segments as defaults and developing more specific segments only for groups whose spending will differ from these and for which reliable use estimates can be

[18] The NVUM segment shares on individual forests should be compared with other sources, as they may not adequately represent different types of visitors on a particular forest. The NVUM sampling plan was not designed to necessarily represent particular types of visitors on a given forest – be they local, day trips, overnight trips or particular activity groups. Estimates of the percentage of anglers, snowmobilers or hikers from the NVUM survey may therefore be unreliable, as they will be sensitive to the sites and time periods selected for sampling. Activities that tend to be concentrated at a few locations or during selected time periods can be completely missed or over-represented in the NVUM sampling plan.

[19] http://www.fs.fed.us/institute/econ_center.html.

made. For most analyses, a set of mutually exclusive visitor segments should be chosen for which both visit estimates and spending profiles can be generated.

2. Choose a spending profile for each segment. If using the NVUM trip segments, begin by selecting from the high, national average, or low profiles based on the characteristics of the particular application. Analysts may choose a profile for the forest or area of interest based upon the forest's classification in Table A-1. Users may also select a profile based upon the spending opportunities in proximity to the area of interest. Note that even though a forest may be classified as high spending, if the application relates to more remote areas of the forest, the low spending profiles may be more appropriate, as spending is largely a function of the number and kinds of nearby spending opportunities. For some applications, analysts may select spending profiles for specific activity-trip type combinations. NVUM spending profiles may be adjusted to suit the local situation/application, as needed. See Stynes, Propst, Chang and Sun (2000) for guidance on adjusting spending averages for local applications or how to use an engineering approach to estimate spending profiles when survey data are not available or of poor quality.

3. Estimate the number of visits by each segment. At the national or forest level, one may multiply total visits by the NVUM estimates of trip segment shares (Table A-2) to distribute visits across the trip segments[20].

4. Convert visits and spending into common units. Recreation visits are on a per person basis, while spending reported in the above tables is on a per party trip basis. One must either divide the spending averages by the average party size to put spending on a per person basis or convert visits to parties by dividing visits by an average party size[21]. NVUM estimates of average party sizes by segment for each forest are reported in Table A-3.

5. Estimate total spending by multiplying the number of visits or parties of each type (segment) by the spending averages for that segment and summing across segments.

6. Apply total spending within spending categories as final demand changes to an input-output model for the local region. The total spending estimated within each spending category can be applied to an input-output model for the local region using appropriate bridge tables to match the NVUM spending categories to IMPLAN sectors. As spending profiles cover spending within a 50-mile radius of the forest, the impact region should roughly cover counties within 50 miles of the forest to estimate local impacts.

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[20] Another complication for some applications is potential double counting of spending by visitors staying overnight off the forest and making multiple visits during their stay in the area. Spending averages are on a trip basis (to the area). If the incidence of multiple national forest visits per trip is known, visits should be converted to distinct trips to the area by dividing by an estimate of visits per trip.

[21] The NVUM averages for people per vehicle are used to estimate party sizes. It must be assumed that in most cases, all people traveling in the same vehicle represent the spending unit.

Attribution issues. When making spending or impact estimates, some decisions must be made regarding which visits or spending should be counted. There are several alternatives here. At one extreme is to count all spending within 50 miles of the forest by anyone who visits the national forest during a trip to the area. This would include incidental visits and quite a bit of spending not directly related to recreating on the national forest. At the other extreme is to make a "with versus without" impact estimate and count only trips and spending that would not have been made in the absence of the forest recreation opportunities. Most situations likely call for something in between.

Whether or not to include spending by local residents is a common question. Some argue that local residents would spend the money locally regardless of the recreation opportunities on the national forest and that it doesn't represent "new" money to the region. Others are interested in capturing all spending associated with forest recreation trips, which includes local resident spending.

Taking a "with versus without" approach, the question is whether the spending would remain in the region or go outside in the absence of forest recreation opportunities. If locals would go outside the region for recreation in the absence of national forest opportunities, their trip spending would represent a loss to the region's economy. A loss of $100 in local resident's trip spending has the same effects as the loss from not attracting a non-resident visitor who spends $100. It therefore should be included in a "with versus without" economic impact assessment. In most cases, some local substitution would occur and some additional trips would go outside the region in the absence of national forest recreation opportunities, so there is no simple yes or no answer to the question of whether spending by local residents should be included or not. For consistency, we recommend including spending by local residents to capture the economic significance of forest recreation opportunities to the region.

More problematic are trips to the region that are not generated by the national forest, but are made for some other purpose. The "non-primary" purpose trip segment is included in our analysis, so that these trips and associated spending may be treated separately. We recommend using the local day trip spending profile for non-primary purpose trips. The rationale is that the local day trip profile covers the additional spending for a recreation visit to the national forest for visitors who are already in the area for some other reason. It excludes possibly several nights of lodging and other expenses, which are evident in the "non-primary" trip spending profile, on the basis that this spending was not associated with the national forest visit. For trips where the national forest is not the primary purpose, only the additional spending for the national forest visit is assumed to be lost to the local economy in the absence of national forest recreation opportunities. This procedure will omit some lodging and related expenses associated with extending a stay in the area to visit the national forest.

It is likely that some visitors in each trip segment would substitute other nearby recreation opportunities in the absence of those provided on the national forest. The extent of substitutions will depend on the local supply of recreation opportunities. In a pure "with versus without" analysis, trips and associated spending that would not be lost

to the region would be excluded. Further study of substitution patterns would be required to fully address the substitution issue. More generally, many trips involving visits to the national forest will involve multiple purposes and activities, making it difficult in some cases to isolate which purpose "caused" the trip to be made.

An Example: Application To The Hiawatha National Forest

The above steps are illustrated for the Hiawatha National Forest in Michigan's Upper Peninsula. First, we show how to generate an overall annual estimate of visitor spending using the default trip type segments and NVUM data. In a second example we illustrate how to combine the trip type segments with special activity spending profiles.

Total recreation visits to the Hiawatha National Forest in 2000 were 682,353 based on the NVUM report (USDA Forest Service 2001). Computation of total visitor spending is shown in Table C-1. Recreation visits are allocated to trip segments using the Hiawatha segment share estimates from Table A-2, adjusted to a party visit basis by dividing by people per vehicle from Table A-3 and then multiplied by the per party trip spending averages to obtain total spending. The national average spending profiles (Table 4) are used, since the Hiawatha National Forest visitor spending patterns were not significantly different from the national averages[22]. Local visitors are included in this example and the local day trip spending average ($30.09) is applied to non-primary purpose trips.

Table C-1. Visitor Spending for Hiawatha National Forest Using NVUM data [a]

	Non-Local residents			Local residents				
	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
Recreation Visits	-	-	-	-	-	-	-	682,353
Segment Shares	1%	4%	31%	32%	2%	8%	22%	100%
Visits by Segment[b]	6,074	24,349	214,511	220,069	12,621	52,892	151,837	682353
Party Size	2.3	2.5	2.3	1.5	2.5	2.4	2.4	
Party Visits[b]	2,641	9,740	93,266	146,713	5,048	22,038	63,265	342,711
Spending ($/Party/Trip)	50.25	155.22	224.38	30.09	110.72	99.26	30.09[c]	
Spending totals (Thousands of $) [b]	$133	$1,512	$20,927	$4,415	$559	$2,188	$1,904	$31,638

[a] Recreation visit estimate is from Hiawatha NF NVUM report, segments shares are from Table A-2, party sizes are from Table A-3 and spending averages are from Table 4.
[b] Calculated rows are: Visits by segment = total recreation visits * segment share, Party visits = Visits by segment / party size, Spending total = spending average * party visits, totals column is the sum across segments.
[c] The spending average for local day trips is used for non-primary purpose trips to capture only the marginal change in spending due to the national forest visit.

[22] There were only 90 usable cases with spending data for the Hiawatha NF in the NVUM survey. While the Hiawatha NF sample spending average of $127 was higher than the national average of $98, the standardized average controlling for the mix of day and overnight trips on Hiawatha NF was below average ($78) (Table A-1). The difference, however, was not statistically significant at the 80% confidence level so the national averages are used.

Based on these calculations, recreation visitors to the Hiawatha National Forest spent $32 million in the local region in 2000. Local day trips accounted for 42% of visits and 23% of spending. Non-residents on overnight trips staying off the forest account for 66% of the spending. The forest also attracts a large number of visits from the "non-primary" purpose segment (22% of overall visits). Counting only the equivalent of local day trip spending for this segment attributes $1.9 million in spending by this segment to the forest. If we had counted this segment's entire spending ($173 per party trip), their total spending would have been $11 million. On the other hand, excluding all spending by local visitors would reduce the total forest estimate by $7.2 million.

To obtain spending in detailed categories for the Hiawatha NF (Table C-2), simply multiply party visits for each segment by the complete spending profile for that segment in Table 4. This itemizes spending within specific categories/sectors. The largest spending for Hiawatha National Forest visitors is for restaurant meals ($7.1 million), gas and oil ($6.3 million), lodging ($5.8 million), and groceries ($4.7 million).

Table C-2. Total Spending of Hiawatha National Forest Recreation Visitors, 2000

	Non-Local Segments			Local Segments				
Spending category	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
	---------- Spending in thousands of dollars ----------							
Public Lodging	0	57	368	0	17	54	0	496
Private Lodging	0	130	5,049	0	30	233	0	5,443
Restaurant	36	261	5,057	910	75	413	392	7,143
Groceries	19	331	2,653	732	185	434	316	4,670
Gas & oil	41	350	2,924	1,639	129	507	707	6,297
Other transp.	4	42	849	41	1	25	18	980
Activities	9	76	1,259	224	18	137	97	1,821
Admissions/fees	13	119	789	443	57	175	191	1,787
Souvenirs	6	58	1,180	175	14	73	75	1,581
Other	6	88	800	251	33	135	108	1,421
Total Spending[a]	**133**	**1,512**	**20,927**	**4,415**	**559**	**2,188**	**1,904**	**31,638**

[a] Columns may not sum to totals due to rounding.

Other data sources could be used to adjust any of the inputs in Table C-1 to better reflect local conditions. To incorporate one or more of the activity segment profiles (tables 9-13) into the analysis, visits involving a particular activity must be split out from the default trip segments and then applied to the corresponding activity spending profile. This is illustrated in Table C-3 where visits with hunting as the primary activity are split out from the general trip segments.

Assume 5% of party visits on the Hiawatha National Forest are primarily for hunting. Five percent of the 342,711 party visits in Table C-1 yeilds 17,136 hunting party visits.

Using the national average distribution of hunting visits by trip segments[23] (Table A-5), these hunting visits are divided among the seven trip segments and then subtracted from total visits in each segment to separate hunting and non-hunting visits. For the three hunting segments with a distinct spending pattern (non-local OVN-NF, local day, and local OVN-NF segments) the special hunter spending averages from Table 11 are substituted for the general trip segment spending averages[24].

The hunter spending averages can now be applied to visits where hunting is the primary purpose, while the general national averages are applied to the general trip segments. Hunters spent an estimated $1.5 million under these assumptions. Summing spending by hunters and non-hunters, total spending is estimated at $31.9 million, slightly above the previous estimate in Table C-1. The difference is due to the higher spending averages being assumed for the special hunting segments. Other activities could be handled in a similar fashion.

Table C-3. Splitting out a distinct activity on the Hiawatha National Forest

	Non-Local residents			Local residents				
	Day	OVN-NF	OVN	Day	OVN-NF	OVN	Non-Primary	Total
Total Party Visits	2,641	9,740	93,266	146,713	5,048	22,038	63,265	342,711
Hunting Segment shares	5%	12%	6%	52%	8%	15%	2%	100%
Hunting Party Visits[a]	857	2,056	1,028	8,911	1,371	2,570	343	17,136
Non-Hunting Visits	1,784	7,684	92,238	137,802	3,677	19,468	62,922	325,575
Average spending								
Hunters[b]	50.25	**184.91**	224.38	**44.16**	**167.12**	99.26	30.09	
Non-hunters	50.25	155.22	224.38	30.09	110.72	99.26	30.09	
Total spending ($000's)[c]								
Hunters	43	380	231	393	229	255	10	1,542
Non-hunters	90	1,193	20,696	4,146	407	1,932	1,893	30,358
Total spending	133	1,573	20,927	4,540	636	2,187	1,904	31,900

[a] Assumes 5% of overall visits are primarily for hunting. Hunting visits are allocated to segments using the hunting segment shares.
[b] Hunter spending averages from Table 11 are used in place of the general trip spending averages for those hunting segments that differ (in bold).
[c] Total spending is computed by multiplying party visits for each group by the corresponding spending averages.

[23] Alternatively, one could assume the trip segment distribution for hunters is the same as visitors in general to the Hiawatha NF (i.e. use the segment shares in Table C-1) or a local hunter survey might provide specific information about hunting trips on the Hiawatha NF.
[24] Strictly speaking, the spending averages for non-hunters should be adjusted from the general averages to reflect the omission of hunters. This adjustment will be very small unless the excluded group represents a large percentage of all visitors and also has very distinct spending averages. In most cases the adjustments will be minimal and can safely be ignored.

To evaluate spending impacts of a particular management alternative, simply use the change in visits due to the alternative within each segment rather than overall annual visits. In some situations a management alternative may involve both a change in visits by a particular segment and a change in spending patterns, for example, closing a campground in a more remote location and opening one closer to commercial facilities. In this case, one might replace the national average spending profiles for these campers (OVN-NF) from Table 4 with the high spending profiles in Table 6.

There are many variations on this general approach, but the primary rule is that visits must be estimated, divided into mutually exclusive (non-overlapping) segments and then a distinct spending average applied to each group. In some cases one may be able to work from estimates of actual numbers of visits by each segment, while in others one may need to estimate visits for a particular segment as a percentage of overall visits.

If using activity-specific spending profiles on forests with above or below average overall visitor spending, some adjustments to the activity-specific spending averages may be in order. If visitors in general to a given national forest spend more or less than the national average, the question is whether hunters, hikers or any other activity-based segment also spend at rates below or above the national averages.

With the exception of the local day trip segment, high spending profiles are roughly 25% above the national averages and low spending profiles are roughly 25% below[25]. If the general spending patterns on a forest are assumed to carry over to specific activities, the activity-specific spending profiles in Tables 9-13 can be adjusted upward or downward by 25%. However, this is a situation where some judgment is likely preferred to applying a fixed rule. When more precise estimates are needed for specific user groups at a given location, a local survey is recommended.

[25] The local day trip spending average only varies by 5-10% between the high and low spending profiles.